What Is Data Collection?

Data Collection
is
obtaining useful information.

The issue is not: *How do we collect data?*

It is: *How do we obtain useful data*?

Why Collect Data?

To estabish a factual basis
for making decisions

I think the problem is . . .

becomes

The data indicate the problem is .

. .

Making a Data Collection Plan

Why do we want the data?

What purpose will they serve?

Formulate your change statement:

If . . . then . . .

Making a Data Collection Plan

Where will we collect the data?

- Refer to the process Flowchart

- Identify steps where you expect changes

- Take data at those steps and at the end of the process

Making a Data Collection Plan

What type of data will we collec

- **Attribute data:** Presence or absence
  of a characteristic

- **Variables data:** Specific measurement

Making a Data Collection Plan

Who will collect the data?

Workers who perform the process steps

- Properly trained

- Provided with resources

Making a Data Collection Plan

How do we collect the right data?

- Small sample sizes

- Collect frequently

- Dependent on availability of data, cost, consequences

Data Collection Problems

Failure to establish Operational

Definitions

- When and how often to collect data
- How to collect data
- Units of measurement
- Criteria for defects
- Handling of multiple defects

Data Collection Problems

Adding bias to the collection process

- Slowdown or speedup
- Fear
- Errors in procedures
- Missing data

Uses for Checksheets

- Record data for further analysis

- Provide historical record

- Introduce Data Collection methods

Types of Checksheets
Tabular Format

DEFECT	12	13	14	15	16	17	18	TOTAL
JULY 94								
WRONG NSN	||	|	||	|	|	|		**8**
FAULTY MATERIAL	|	||		|		|		**5**
PMS NOT DONE	||	|||	||	|||	|	|||	||	**16**
INSTALL PROBLEMS				|		|		**2**

Types of Checksheets
Location Format

DATE: _____

COMMENTS: _____

DEPT: _____

_____

X

X

X X

X

XX X

LOT NUMBER: _____

X X

NUMBER OF BURRS: _____

X

DEFECT LOCATIONS

INSPECTOR: _____
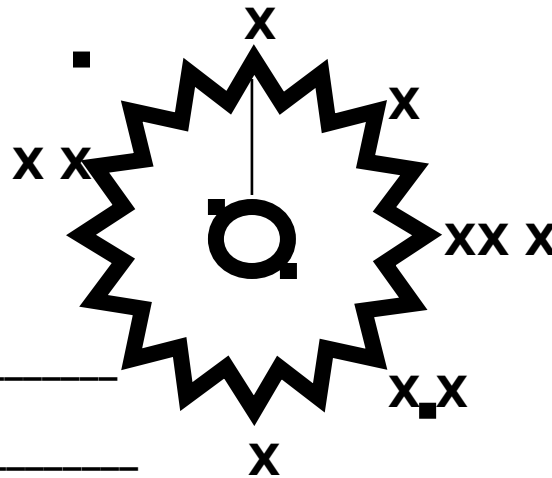
Location of burrs on a special gear marked with an **X**.

Types of Checksheets

Graphic Format
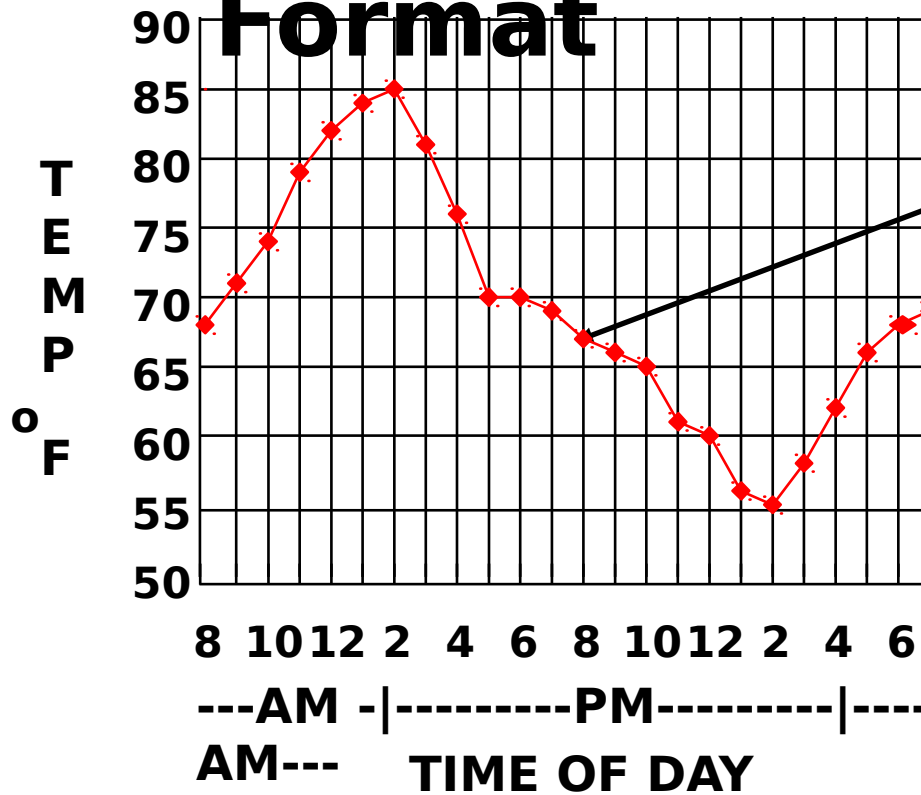
Workers plot each data point on the graph

90
85
80
75
70
65
60
55
50

T
E
M
P
o
F

8 10 12 2 4 6 8 10 12 2 4 6

---AM -|---------PM---------|----
AM---   TIME OF DAY

Making a Useful Checksheet

- Tailored for specific purpose

- Workers help develop form

- Columns labeled clearly

- User-friendly format

Pharmacy Example Flowchart

```
┌─────────────────┐        ┌─────────────────┐        ┌─────────────────┐
│ PATIENT TURNS   │        │  PRESCRIPTION   │        │  PRESCRIPTION   │
│ PRESCRIPTION IN │───────▶│  LOGGED INTO    │───────▶│  PASSED TO      │
│ AT  PHARMACY    │        │  PHARMACY       │        │  PHARMACIST     │
└─────────────────┘        └─────────────────┘        └─────────────────┘
                                                               │
                        ╭──────────────────╮                   │
                        │   Data are       │                   │
                        │ collected here   │                   ▼
┌─────────────────┐     ╰──────────────────╯      ┌─────────────────┐
│  PRESCRIPTION   │    ┌─────────────────┐         │  PRESCRIPTION   │
│  RETURNED TO    │◀───│  PRESCRIPTION   │◀────────│  FILLED BY      │
│ PHARMACY WINDOW │    │  BOTTLE LABELED │         │  PHARMACIST     │
└─────────────────┘    └─────────────────┘         └─────────────────┘
        │
        ▼
┌─────────────────┐        ┌─────────────────┐        ┌─────────────────┐
│ PATIENT CALLED  │        │ PATIENT PROVIDES│        │ PATIENT RECEIVES│
│ TO PHARMACY     │───────▶│ IDENTIFICATION  │───────▶│ PRESCRIPTION    │
│ WINDOW          │        │                 │        │                 │
└─────────────────┘        └─────────────────┘        └─────────────────┘
```

Pharmacy Example Checksheet

Pharmacist annotates on the checksheet the time (in mins) it takes to fill the prescription.

Time to fill prescription

Time for pharmacist's actions

Time (Mins)

25
20
15
10
5
0

8 9 10 11 12 13 14 15 16 17 18 19

Time of Day
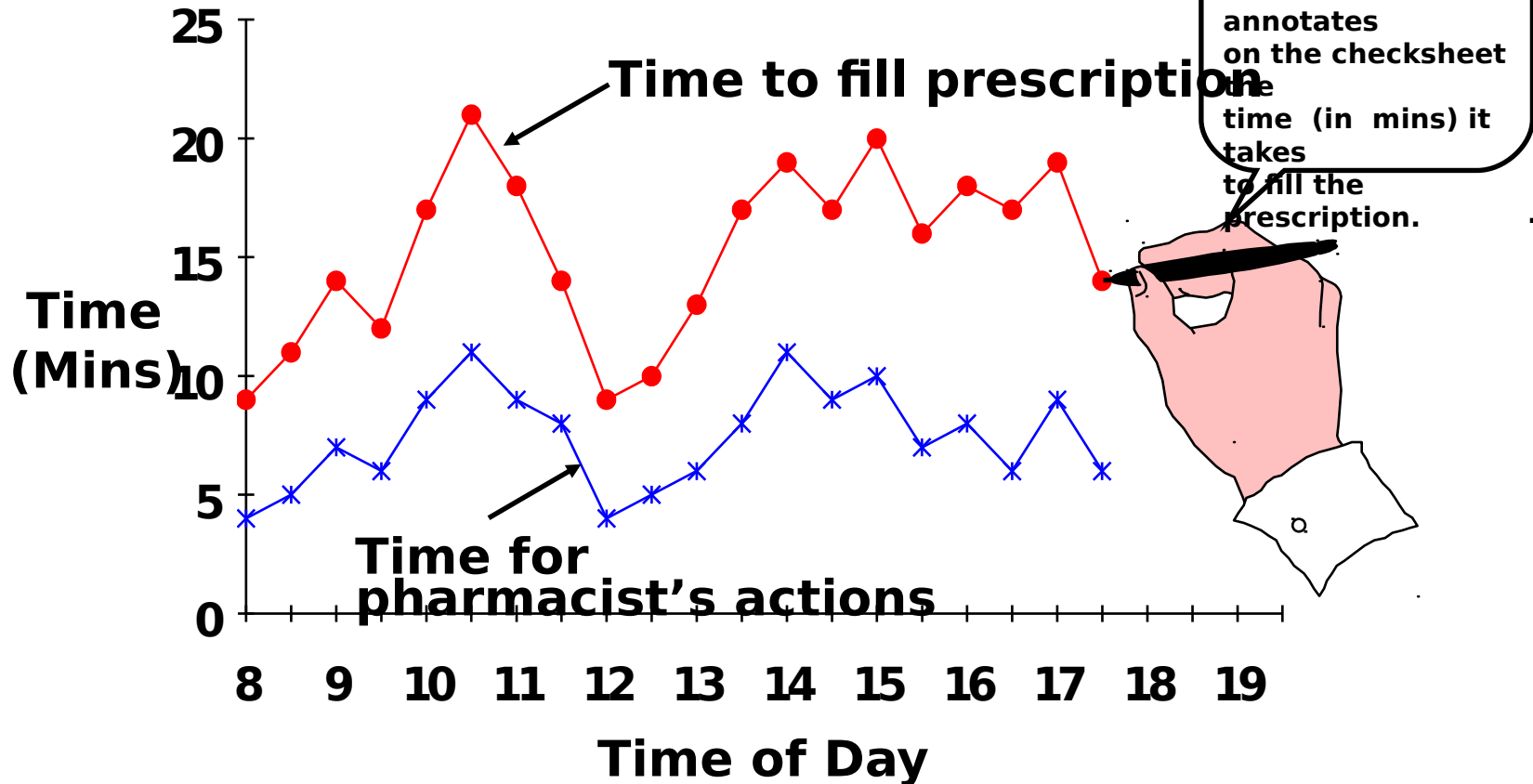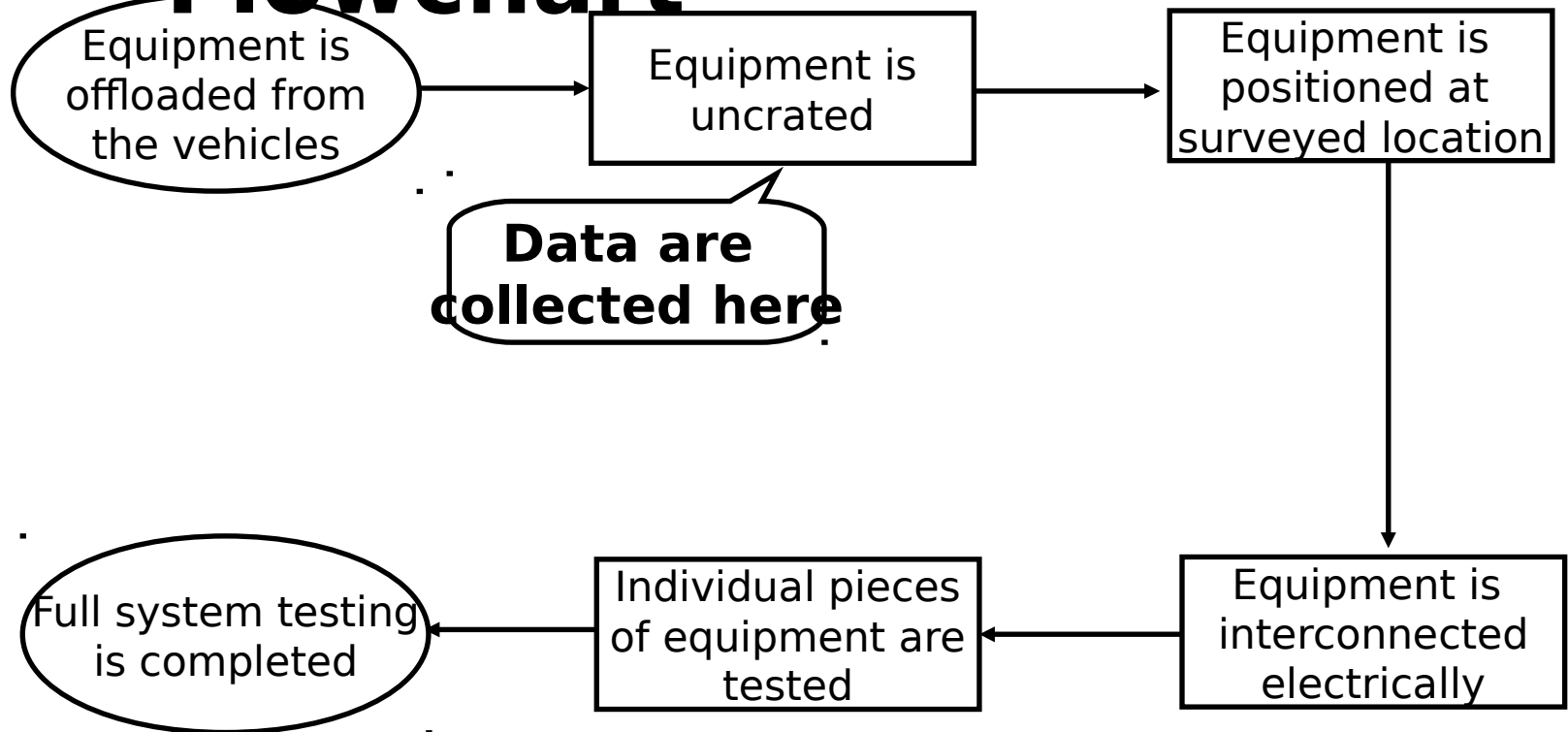
LEGEND: MAKALAPA NAVMEDCLINIC - 16 July 94 - Elapsed time to fill prescription - 1 every 30 mins

Gateway Example Flowchart

```
┌─────────────────┐        ┌─────────────────┐        ┌─────────────────┐
│  Equipment is   │        │                 │        │  Equipment is   │
│ offloaded from  │───────▶│  Equipment is   │───────▶│  positioned at  │
│  the vehicles   │        │    uncrated     │        │surveyed location│
└─────────────────┘        └─────────────────┘        └─────────────────┘
```

Data are collected here

```
┌─────────────────┐        ┌─────────────────┐        ┌─────────────────┐
│   Full system   │        │ Individual pieces│       │  Equipment is   │
│ testing is      │◀───────│ of equipment are│◀───────│ interconnected  │
│  completed      │        │     tested      │        │   electrically  │
└─────────────────┘        └─────────────────┘        └─────────────────┘
```

Gateway Example Checksheet

UNCRATING (IN MINS)		TOTAL TIME (IN MINS)	
160-179	/	0550-0599	| |
180-199	/ //	0600-0649	/
200-219	/ /	0650-0699	/ / /
220-239	/	0700-0749	/ / /
240-259	////	0750-0799	//// /
260-279	/ / / /	0800-0849	
280-299	| / |	0850-0899	/ /
300-319		0900-0949	/
320-339	|	0950-0999	/ /
340-359		1000-1049	
360-379	|	1050-1099	/

LEGEND: Elapsed time (in mins) to uncrate equipment - 19 August 94 - MCBH Kaneohe Bay, Hawaii

Checksheet

Example

MOUNT 31 GUNEX DATA

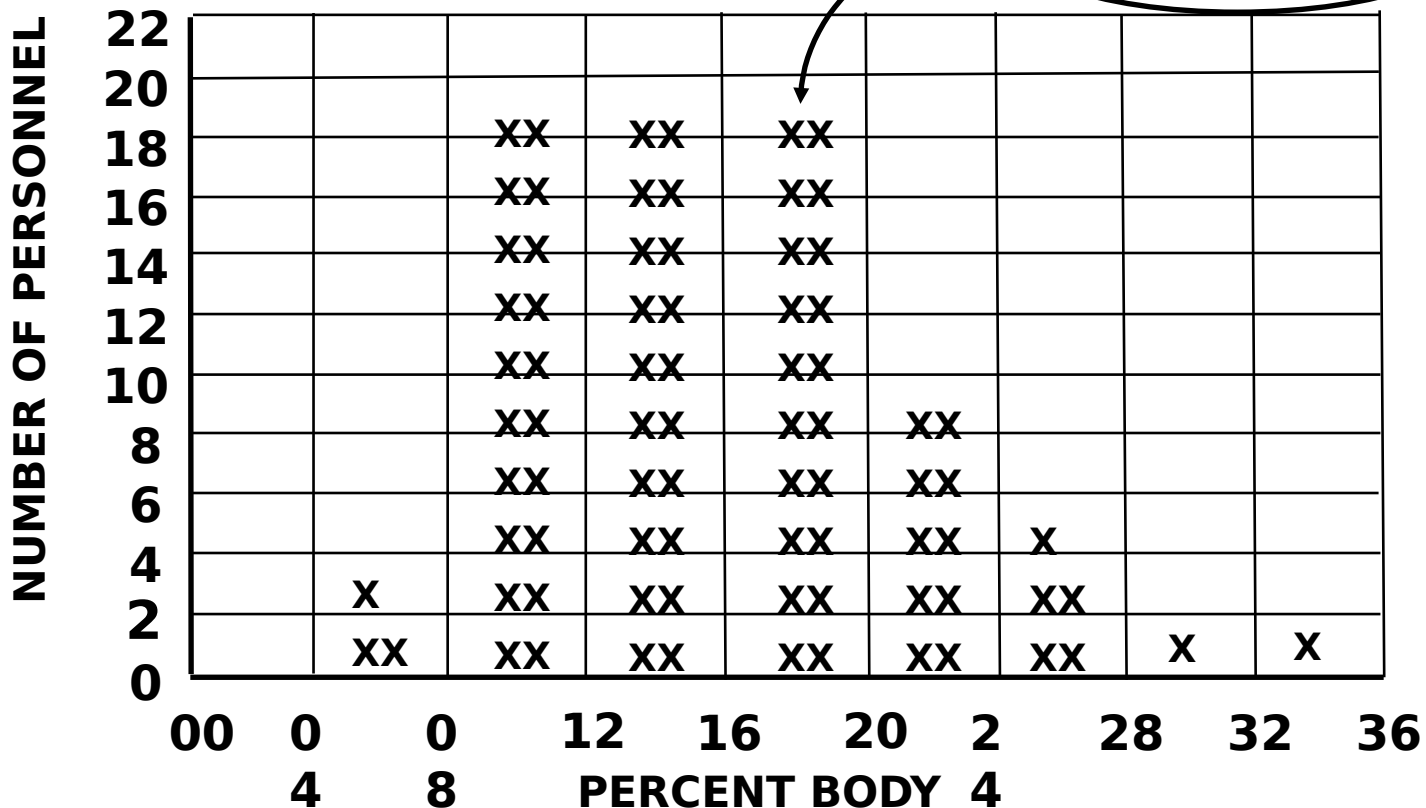| YARDS FROM THE TARGET	COUNTS
-180 YDS to -120 YDS	|||
-120 YDS to -060 YDS	~~||||~~
-060 YDS to 000 YDS	~~||||~~ ~~||||~~ |||
000 YDS to 060 YDS	~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~
060 YDS to 120 YDS	~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||
120 YDS to 180 YDS	~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||||
180 YDS to 240 YDS	~~||||~~ ~~||||~~ ~~||||~~ ||||
240 YDS to 300 YDS	~~||||~~ ~~||||~~ |||
300 YDS to 360 YDS	~~||||~~	
360 YDS to 420 YDS	||||

Data taken: USS CROMMELIN (FFG-37) at PMRF, 135 RDS BL&P, Mount 31, 25 June 94

Checksheet Example

BODY FAT DATA

DATA COLLECTORS SIMPLY PLACE AN X ON THE CHECKSHEET

NUMBER OF PERSONNEL

22									
20			XX	XX	XX				
18			XX	XX	XX				
16			XX	XX	XX				
14			XX	XX	XX				
12			XX	XX	XX				
10			XX	XX	XX	XX			
8			XX	XX	XX	XX			
6			XX	XX	XX	XX	X		
4		X	XX	XX	XX	XX	XX		
2		XX	XX	XX	XX	XX	XX	X	X
0									

00   04   08   12   16   20   24   28   32   36

PERCENT BODY FAT

Data taken: USS LEADER (MSO-490), all 80 personnel assigned, 25 June 94

Checksheet Example
GEAR DEFECT DATA

Defect Category	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	TOTAL
I.D. Size Wrong	I			I	II					I		5
O.D. Size Wrong		I										1
Nicks		II			II	II	II		I	I	II	12
Burrs			I	I	I		I	I	I	I	II	9
Tooth Geometry	I							I				2
Blemishes	I	II		I		I		I			II	8
Other			I									1
Total	3	5	2	3	5	3	3	3	2	3	6	38

Checksheet Example

EQUIPMENT BREAKDOWN DATA

Time OOC	Machine A			Machine B			Shift Total
	Shift 1	Shift 2	Shift 3	Shift 1	Shift 2	Shift 3	
00-30 Mins		M				E	2
30-60 Mins	C			M			2
1 - 1-1/2 Hrs			E	E	H		3
1-1/2 - 2 Hrs		H				M	2
2 - 2-1/2 Hrs			H				1
Total	**1**	**2**	**2**	**2**	**1**	**2**	**10**

FAULTS: M = Mechanical, E = Electrical, C = Coolant, H = Hydraulic